

**REMARKS/ARGUMENTS**

**A. Summary of Examiner Interview of October 22, 2007**

The Applicant would like to thank Examiner Robert Fetsuga for taking time on October 22, 2007 to discuss this case with the Applicant's representative Brigide Mattar. During the interview, both the Applicant's representative and the Examiner sought to clarify their respective points of view with respect to the subject matter of claim 42. More specifically, the Examiner referred to column 18 line 66 through column 19 line 12 of Tompkins ('720) to support his position that, in the context of a freeze protection, it was known to repetitively cause a pump of a spa to be activated for a certain time period and then deactivated at least in part on the basis of a rate of purge. The Applicant's representative disagreed and argued that the above mentioned excerpt in Tompkins ('720) did not teach that feature. No particular agreement was reached as a result of the interview.

**B. Summary of the Amendments**

The application now contains 17 claims.

Claims 60-66 have been cancelled without prejudice or disclaimer.

Claims 46, 47, 55 and 56 remain withdrawn. Claims 46, 47, 55 and 56 were previously withdrawn as being directed to a non-elected species in light of the absence of an allowable generic or linking claim. The applicant expects that these claims will be re-introduce in the present application if a generic or linking claim is found to be allowable.

Claims 42-45, 48, 50-54, 57, 59 and 67 are unchanged by the present amendment.

The Applicant submits that no new matter is being added to the present application through the present amendment.

**B. Objection to the Specification**

The Examiner has objected to the specification under 37 CFR 1.75(d)(1) and MPEP §608.01(o) as failing to provide proper antecedent basis for the claimed subject matter.

More specifically, the examiner has requested that the specification be amended in order to provide proper antecedent basis for the following terms:

- method (claim 60)
- means (claim 66).

The Applicant respectfully disagrees with the Examiner and continues to be of the view that the specification complies with 37 CFR 1.75(d)(1) and MPEP §608.01(o) with respect to claims 60 and 66. However in order to hasten prosecution of the present application and to move this case forward towards allowance, claims 60 and 66 have been cancelled. It is therefore believed that the Examiner's objection to the specification is now moot.

**C. Statements of Rejection under 35 USC §103 and Reply**

In the Office Action, The Examiner has rejected claims 42-45, 51-54, 60-63, 66 and 67 under 35 U.S.C. §103(a) as being unpatentable over U.S. patent no. 5,559,720 (hereinafter referred to as Tompkins et al.) in view of U.S. patent no. 4,685,158 (hereinafter referred to as Lively.)

In the Office Action, the Examiner has further rejected claims 48 and 57 under 35 U.S.C. §103(a) as being unpatentable over Tompkins et al. and Lively as applied to claims 42 and 51 above in further view of US Patent 4,233,694 (hereafter to be referred to as Janosko et al.).

In the Office Action, the Examiner has further rejected claims 50, 59 and 65 under 35 U.S.C. §103(a) as being unpatentable over Tompkins et al. and Lively as applied to claims 42 and 51 above in further view of U.S. patent no. 4,189,791 (hereafter referred to as Dundas).

Claims 60-66 have been cancelled and as such the Examiner's rejection under 35 U.S.C. §103(a) having regard to these claims is considered moot.

With respect to claims 42-45, 48, 50-54, 57, 59 and 67, the Applicant respectfully traverses the Examiner's rejections and submits that the subject matter of these claims is neither anticipated nor rendered obvious by the cited documents for the reasons presented below.

On the basis on the Examiner interview of October 22 2007, it appears to the Applicant that the Examiner may be misinterpreting the Tompkins reference in particular as it pertains to the freeze protection functions described in this reference. In the sections below, the Applicant has provided a detailed explanation of the teachings of the Tompkins reference as they relate to freeze protection.

Claim 42

Independent claim 42 reads as follows:

42. A freeze control system for a spa, said freeze control system comprising:
- a) a temperature sensor suitable for obtaining a measurement of an ambient air temperature near the spa;
  - b) a spa controller in communication with said temperature sensor for receiving a signal conveying said measurement of the ambient air temperature near the spa, said spa controller being programmed for:
    - i) **processing said signal to derive a rate of purge data element, said rate of purge data element being associated to a certain ambient air temperature;**
    - ii) **at least in part on the basis of the rate of purge data element, repetitively causing at least one pump of the spa to be activated for a certain time period and then deactivated,** such as to repetitively cause the at least one pump of the spa to run for the certain time period.

The Applicant submits that the subject matter of claim 42 is neither anticipated nor rendered obvious by the documents cited by the Examiner. Without limiting the generality of the foregoing, the applicant submits that the above emphasized limitations of claim 42 are neither taught nor suggested by Lively and Tompkins et al. considered alone or in combination.

More specifically, the applicant submits that neither Tompkins et al. nor Lively et al. teach or suggest the following features of claim 42:

- a spa controller [...] programmed for: processing said signal to derive a rate of purge data element, said rate of purge data element being associated to a certain ambient air temperature; and
- a spa controller [...] programmed for: [...] at least in part on the basis of the rate of purge data element, repetitively causing at least one pump of the spa to be activated for a certain time period and then deactivated, such as to repetitively cause the at least one pump of the spa to run for the certain time period.

On page 3 of the Office Action, the Examiner argues that Tompkins teaches all the features of claim 42 with the exception of an ambient air temperature sensor.

The Applicant respectfully disagrees.

**Firstly, Tompkins does not teach or suggest a freeze control system for a spa including a spa controller [...] programmed for repetitively causing at least one pump of the spa to be activated for a certain time period and then deactivated at least in part on the basis of a rate of purge data element.**

On p. 4, the Examiner argues that Tompkins teaches repetitively causing a pump to be activated. In support of this argument, the Examiner relies on the following sections of Tompkins: column 8 lines 25-32 and column 18 line 66 to column 19 line 12.

The Applicant invites the Examiner to review the paragraphs referred to above since the Applicant is of the view that none of these paragraphs teach or suggest repetitively causing at least one pump of the spa to be activated for a certain time period and then deactivated at least in part on the basis of the rate of purge.

The excerpt at column 8, lines 25-32 is reproduced below for the Examiner's ease of reference:

This scheduled heating function allows the user to define the hysteresis that is to be used when the spa is unattended. It also allows a "start time" to be defined. The spa will begin heating whenever the temperature drops below the low temperature setting or the time matches the start time. With an appropriate temperature envelope, this will allow the spa to heat once a day while unattended.

The above excerpt merely describes the possibility of allowing the user to define the minimum and maximum allowable water temperatures in the spa while the latter is unattended and to specify the start time for beginning to heat the water. Nowhere in the excerpt above is it remotely suggested to repetitively cause a pump of the spa to be activated for a certain time period and then deactivated. Moreover, nowhere in the excerpt above is it remotely suggested to repetitively cause a pump of the spa to be activated for a certain time period and then deactivated at least in part on the basis of a rate of purge.

Column 18 line 66 to column 19 line 12, which describes the operation of the spa system in Tompkins for addressing the presence of frozen water in the system is reproduced below for the Examiner's ease of reference:

"The system provides two functions regarding freezing of the water in the system. First, if either temperature sensor reads a temperature of thirty-four degrees or lower, the spa is considered frozen and all operations are disabled. The heater, the pumps and the blower are disabled to avoid damage to the mechanisms. Second, if the heater temperature drops below thirty-eight degrees, an impending freeze is signaled. The reaction to this condition is to run the low speed pump for five minutes. If the condition has not improved, the heater is started. Every five minutes thereafter, the temperature is rechecked. If the condition clears (the temperature rises above forty degrees), operations return to normal."

The above excerpt indicates that, if the water temperature goes below 34 F, the spa is considered frozen and all operations are disabled. The above excerpt also indicates that, when the water temperature goes below 38 F, the pump is turned on for five minutes, at which point the situation is reassessed. The situation is reassessed by determining if the water temperature has risen above 40F. If the condition has not improved (the water temperature is below 40F), the heater is then turned on. The system then monitors the water temperature every 5 minutes until the condition clears (the temperature rises above forty degrees). In order to facilitate the understanding of the freeze-protection feature of Lively, the Applicant invites the examiner to consider figure 1 below, which illustrates the behavior of the pump and heater in the presence of changing water temperature conditions.

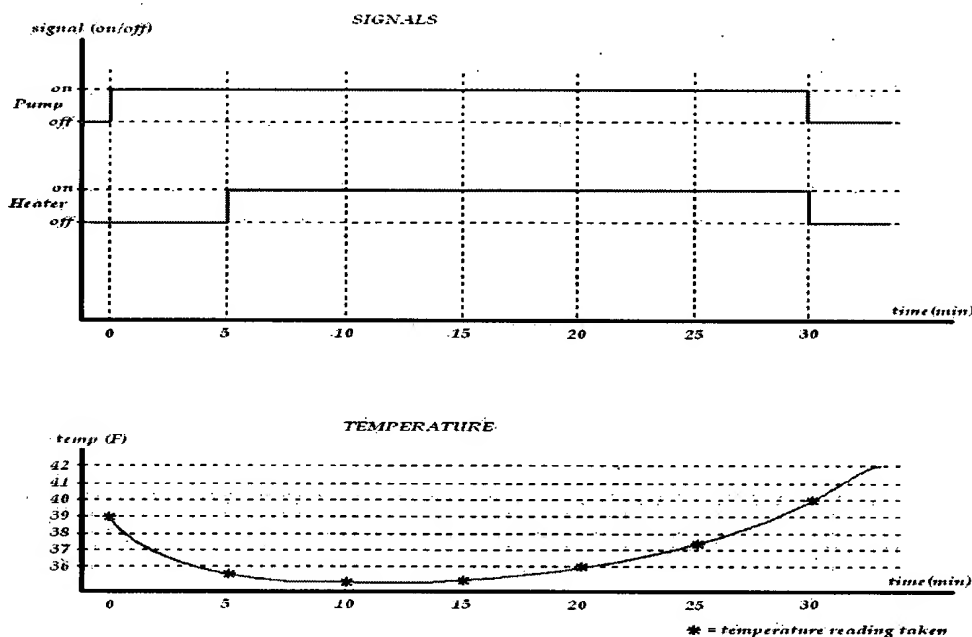


Figure 1: Timing diagram

As illustrated in figure 1, in Tompkins et al., if freezing of the water in the pipes is imminent, the system attempts to rectify the problem, first by using a pump alone and, if that hasn't succeeded after five minutes, by heating the water using the heater until it warms up to an acceptable temperature (above 40 F). Tompkins et al. does not disclose any repetitive activation/deactivation of the pump of the system, much less repetitive activation/deactivation of the pump at a rate associated with a temperature. The only action that is performed repetitively in Tompkins et al. is that the temperature is checked every five minutes until the condition of impending freeze clears (the temperature rises above forty degrees).

In figure 1, the water pump is shown as remaining on beyond the first five minutes at which time the situation is "reassessed" and the heater is turned on if the condition has not improved. Although in this excerpt Tompkins et al. doesn't explicitly say that the pump remains on after the first 5 minutes, it is submitted that a person of ordinary skill in the art of spa controllers would understand that the pump would remain on while the heater is on. More specifically, while the heater is on, the pump should also be on in order to ensure that there is a flow of water from the spa tub, through the heater and back to the spa tub. As will be appreciated, without such a flow, the heater would simply heat the portion of water contained within the heater and would not heat the water in the overall bathing unit resulting in overheating of water around the heating element. Hence, the water pump being off while the heater is turned on would result in a totally unworkable system. Moreover, at columns 2 lines 55-61 of Tompkins, it is indicated that: "*The heater 26 may be interlocked to the pump 24 so that the pump 24 is continuously pumping water over the heating element (not shown) 29 of the heater 26 while the heater 26 is activated. This prevents a "hot spot" from developing in the spa system which could damage the components of the spa or give erroneous measurements.*" In light of the above, even though Tompkins et al. doesn't explicitly say that the pump remains on after the first 5 minutes, it is submitted that a person of ordinary skill in the art of spa controllers would understand that the pump would remain on while the heater is on.



However, whether the pump stays on or shuts off at the time the situation is “reassessed” after the first 5 minutes is not of particular importance to the present case. The Applicant invites the examiner to consider figure 2, which illustrates the behavior of the pump and heater in the presence of changing water temperature conditions in the unlikely situation where the pump would be turned off after the first 5 minutes.

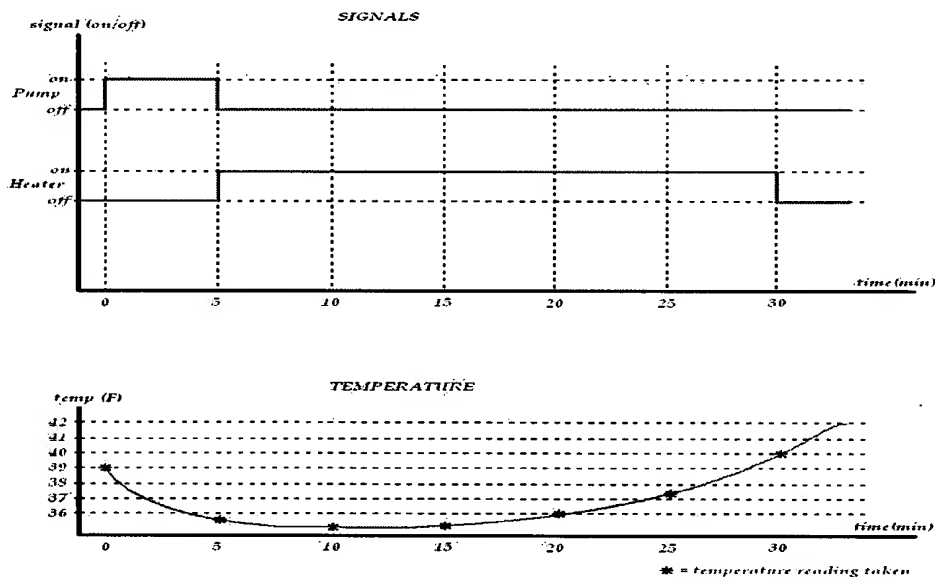


Figure 2: Timing diagram if pump shuts off when heater runs.

It should be emphasized that the condition depicted in figure 2 above is not realistic for the reasons described above and would not be used in a real life system. It has only been presented here for the purpose of illustrating that even in this very unlikely interpretation of the Tompkins reference, there is no repetitive activation/deactivation of the pump of the system, much less repetitive activation/deactivation of the pump at a rate associated with a temperature.

In light of the above, the Applicant submits that there is nothing in Tompkins et al. that teaches or suggests a freeze control system for a spa including a spa controller [...] **programmed for repetitively causing at least one pump of the spa to be activated for a certain time period and then deactivated** at least in part on the basis of a rate of purge data element.

In addition it is submitted that none of the references relied upon by the Examiner, including the Lively reference, teach or suggest a freeze control system for a spa including a spa controller [...] programmed for repetitively causing at least one pump of the spa to be activated for a certain time period and then deactivated at least in part on the basis of a rate of purge data element.

**Secondly, Tompkins does not teach or suggest a freeze control system for a spa including a spa controller [...] programmed [...] to derive a rate of purge data element.**

On page 3 of the Office Action, the Examiner argues that Tompkins discloses a controller programmed for processing a temperature sensor signal. In support of this argument, the Examiner relies on the following sections of Tompkins: column 8 lines 25-32 and column 18 line 66 to column 19 line 12.

The Applicant invites the Examiner to review the paragraphs referred to above since the Applicant is of the view that none of these paragraphs teach or suggest deriving a rate of purge data element.

The Applicant would like to point out that, although the Tompkins discloses a controller programmed for processing a temperature sensor signal, the controller in Tompkins does not process a temperature sensor signal to derive a rate at which a purge of the system is to be conducted. As described above, the excerpt at column 8, lines 25-32 merely describes the possibility of allowing the user to define the minimum and maximum allowable water temperatures in the spa while the latter is unattended and to specify the start time for heating the water. Nowhere in the excerpt above is it remotely suggested to derive a rate of purge data element.

In addition, also as previously described, the excerpt from column 18 line 66 to column 19 line 12, merely indicates that, if freezing of the water in the pipes is imminent, the system attempts to rectify the problem, first by using a pump alone and, if that hasn't succeeded after five

minutes, by heating the water using the heater until it warms up to an acceptable temperature (above 40 F). Tompkins et al. does not disclose any repetitive activation/deactivation of the pump of the system, much less repetitive activate/deactivate at a rate associated with a temperature. The only action that is performed repetitively in Tompkins et al. is that the temperature is checked every five minutes until the condition of impending freeze clears (the temperature rises above forty degrees). The five (5) minute interval at which the temperature is checked is not a rate at which a purge of the system is conducted.

In light of the above, it is submitted that there is nothing in Tompkins that describes a spa controller [...] programmed [...] to derive a rate of purge data element.

In addition it is submitted that none of the references relied upon by the Examiner, including the Lively reference, teach or suggest a freeze control system for a spa including a spa controller [...] programmed to derive a rate of purge data element.

**Thirdly, Tompkins does not teach or suggest a freeze control system for a spa including a spa controller [...] programmed [...] for processing a signal conveying a measurement of an ambient air temperature near the spa to derive a rate of purge data element, said rate of purge data element being associated to a certain ambient air temperature.**

Since Tompkins does not teach or suggest controller [...] programmed [...] to derive a rate of purge data element, it follows that Tompkins does not teach or suggest a spa controller [...] programmed for processing a signal conveying a measurement of the ambient air temperature near the spa to derive a rate of purge data element, the rate of purge data element being associated to a certain ambient air temperature.

In fact, there is nothing in Tompkins that even hints at anything that resembles processing any temperature measurement to derive a rate at which a purge of the system is to be conducted.

In addition it is submitted that none of the references relied upon by the Examiner, including the Lively reference, teach or suggest a freeze control system for a spa including a spa

controller [...] programmed for processing a signal conveying a measurement of an ambient air temperature near the spa to derive a rate of purge data element, the rate of purge data element being associated to a certain ambient air temperature.

**Fourthly, as the Examiner has already correctly pointed out at the bottom of p. 3, Tompkins does not disclose using an ambient air temperature sensor in any way in connection with the controller.**

Rather, the temperature sensor signals referred to in Tompkins include a sensor 20 for measuring the temperature of the water at the heating element 29 and a sensor 21 for measuring the temperature of the water in the container 11 (spa tub) [see column 16 lines 28-32]. As such, Tompkins fails to teach processing a signal conveying a measurement of the ambient air temperature near the spa.

In the Office Action, on page 4, the Examiner relies on Lively to show that it is known to provide a programmed controller making use of an ambient air temperature sensor. The Examiner proposes that Tompkins could be modified in light of the teaching of Lively to associate an ambient air temperature sensor with the Tompkins programmed controller in order to protect against damaging air temperature.

Lively makes use of a temperature sensing circuit 110 and sensing element 111 where the sensing element is mounted so as to be exposed to ambient air (see column 6, lines 41-52). However, Lively merely relies on the temperature measurement to actuate a relay. There is nothing in Lively that teaches or remotely suggests making use of measurement of the ambient air temperature near the spa to derive a rate of purge data element. Since Lively that teaches or remotely suggests making use of measurement of the ambient air temperature near the spa to derive a rate of purge data element, it follows that Lively does not teach or suggest and repetitively causing a pump of a spa to run for a certain time period at least in part on the basis of the rate of purge data element.

The Applicant respectfully submits that even if Tompkins were to be modified in light of the teaching of Lively to make use of an ambient air temperature sensor, this would still not result in something that would read on the invention claimed in claim 42.

More specifically, any combination of Tompkins and Lively would fail to teach or suggest a freeze control system for a spa [...] comprising a spa controller [...] programmed for:

- processing a signal conveying a measurement of an ambient air temperature near the spa to derive a rate of purge data element, said rate of purge data element being associated to a certain ambient air temperature; and
- at least in part on the basis of the rate of purge data element, repetitively causing at least one pump of the spa to be activated for a certain time period and then deactivated, such as to repetitively cause the at least one pump of the spa to run for the certain time period.

Yet the above features are required by claim 42.

In addition, in the absence of hindsight afforded by the present application, there is also no motivation whatsoever in the art for modifying the teachings of either Tompkins or Lively et al. in such a way that it would read on the claimed invention.

As such, the applicant submits that the subject matter of claim 42 is novel and non-obvious in light of Tompkins and Lively et al. considered alone or in combination. Consequently, the Applicant submits that claim 42 is patentable and requests that the Examiner's rejection under 35 USC §103 be withdrawn.

**COMMENTS REGARDING OTHER REFERENCES CITED IN THE OFFICE ACTION**

Although the Examiner has not relied upon Janosko et al. and Dundas to reject claim 42, he has relied on these references in combination with Tompkins and Lively et al. to reject certain ones of the dependent claims. The Applicant submits that the same features that were shown to be absent from Tompkins and Lively et al. are also absent from Janosko et al. and Dundas.

**Janosko et al. Reference**

Janosko discloses a spa having a simplified construction for low-cost installation and easily accessible controls. Janosko provides very few details of temperature control, however on column 6, lines 41-45, Janosko indicates that a temperature gauge provides the control panel with an indication of the temperature within the spa. Later on (column 7, lines 23-27). Janosko indicates that a desired temperature could be achieved by setting a control knob to a position indicative of the temperature. In column 7, lines 45-55, Janosko suggests using the spa in freezing temperatures by selecting, via the control knob, a desired temperature that is above the freezing point of water.

The Applicant respectfully submits that the features shown above to be absent from Tompkins and Lively are also absent from Janosko. Specifically, Janosko also fails to teach or suggest deriving a rate of purge (data element) associated to a certain (ambient air) temperature and fails to teach or suggest repetitively causing a pump of the spa to be activated for a certain time period and then deactivated at least in part on the basis of the rate of purge (data element).

**Dundas Reference**

Dundas discloses a system that is conditioned to respond to temperature differentials between ambient air and water.

The Applicant respectfully submits that the features shown above to be absent from Tompkins and Lively are also absent from Dundas. Specifically, Dundas also fails to teach or suggest deriving a rate of purge (data element) associated to a certain (ambient air) temperature and fails to teach or suggest repetitively causing a pump of the spa to be activated for a certain time period and then deactivated at least in part on the basis of the rate of purge (data element).

Claims 43-45, 48 and 50

Claims 43-45, 48 and 50 depend directly or indirectly from claim 42 and as such incorporate by reference all its limitations. As such, the applicant submits that the subject matter of claims 43-45, 48 and 50 is also neither taught nor suggested by the documents cited by the Examiner.

**Claim 43**

Notwithstanding the foregoing argument, the Examiner's attention is respectfully directed to dependent claim 43, which is reproduced below for the reader's ease of reference:

43. A freeze control system as defined in claim 42, wherein processing said signal to derive the rate of purge data element includes **selecting a rate of purge data element from a set of possible rates of purge data elements**, each rate of purge data element in the set of possible rates of purge data elements having a respective rate value.

The Applicant submits that the subject matter of claim 43 is neither taught nor suggested by Tompkins, considered alone or in combination with Lively. More specifically, neither Tompkins nor Lively teaches or suggests selecting a rate of purge data element from a set of possible rates of purge data elements.

Accordingly, for the reasons described above, the Applicant respectfully submits that the subject matter of dependent claim 43 is both novel and non-obvious over Tompkins, an Lively and, as such, is in condition for allowance.

**Claim 44**

Notwithstanding the foregoing argument, the Examiner's attention is respectfully directed to dependent claim 44, which is reproduced below for the reader's ease of reference:

44. A freeze control system as defined in claim 42, wherein processing said signal to derive the rate of purge data element includes **applying a correction factor to said signal conveying said measurement of the ambient air temperature near the spa.**

The Applicant submits that the subject matter of claim 44 is neither taught nor suggested by Tompkins, considered alone or in combination with Lively. More specifically, neither Tompkins nor Lively teaches or suggests applying a correction factor to a signal conveying a measurement of the ambient air temperature near the spa to derive a rate of purge data element.

Accordingly, for the reasons described above, the Applicant respectfully submits that the subject matter of dependent claim 44 is both novel and non-obvious over Tompkins, an Lively and, as such, is in condition for allowance.

Claim 51

Independent claim 51 reads as follows:

51. A spa system having water freeze control capabilities, said spa system comprising:
- a) a spa tub for holding water;
  - b) a water heater;
  - c) spa piping interconnecting said spa tub and said water heater, said spa piping including at least one pump for circulating water between said water heater and said spa tub;
  - d) a temperature sensor suitable for obtaining a measurement of an ambient air temperature near said spa system;
  - e) a spa controller in communication with said temperature sensor for receiving a signal conveying said measurement of the ambient air temperature near said spa system, **said spa controller being programmed for:**
    - i) **processing said signal conveying said of the ambient air temperature near said spa system to derive a rate of purge data element, said rate of purge data element being associated to a certain ambient air temperature;**



- ii) **at least in part on the basis of the rate of purge data element, repetitively causing the at least one pump of the spa to be activated for a certain time period and then deactivated, such as to repetitively cause the at least one pump of the spa to run for the certain time period.**

The Applicant submits that the subject matter of claim 51 is neither anticipated nor rendered obvious by the documents cited by the Examiner. Without limiting the generality of the foregoing, for the same reasons as those set forth with respect to claim 42, the applicant submits that the above emphasized limitations of claim 51 are neither taught nor suggested by Lively or Tompkins et al. considered alone or in combination.

In light of the above, the Applicant submits that the subject matter of claim 51, is neither taught nor suggested by the documents cited by the Examiner. Consequently, the Applicant submits that claim 51 is patentable.

Claims 52-54, 57 and 59

Claims 52-54, 57 and 59 depend directly or indirectly from claim 51 and as such incorporate by reference all its limitations. As such, the applicant submits that the subject matter of claims 52-54, 57 and 59 is also neither taught nor suggested by the documents cited by the Examiner.

Claim 67

Independent claim 67 reads as follows:

- 67. A freeze control system for a spa, said freeze control system comprising:
  - a) a temperature sensor suitable for obtaining a measurement of an ambient air temperature near the spa;
  - b) a spa controller in communication with said temperature sensor for receiving a signal conveying said measurement of the ambient air temperature near the spa, **said spa controller being programmed for repetitively causing at least one pump of the spa to be activated for a certain time period and then deactivated at a repetition rate conditioned at least in part on the basis of said measurement associated to an ambient air temperature near the spa.**

The Applicant submits that the subject matter of claim 67 is neither anticipated nor rendered obvious by the documents cited by the Examiner.

Without limiting the generality of the foregoing, for the same reasons as those set forth with respect to claim 42, the applicant submits that neither Lively nor Tompkins et al. teaches or suggests a spa controller programmed for repetitively causing at least one pump of the spa to be activated for a certain time period and then deactivated at a repetition rate conditioned at least in part on the basis of said measurement associated to an ambient air temperature near the spa.

Rather in Tompkins et al., if freezing of the water in the pipes is imminent, the system attempts to rectify the problem, first by using a pump alone and, if that hasn't succeeded after five minutes, by heating the water using the heater until it warms up to an acceptable temperature (above 40 F). Tompkins et al. does not disclose any repetitive activation/deactivation of the pump of the system, much less repetitive activation/deactivation of the pump at a rate conditioned based on an air temperature. The only action that is performed repetitively in Tompkins et al. is that the temperature is checked every five minutes until the condition of impending freeze clears (the temperature rises above forty degrees).

In Lively, there is also nothing that teaches or suggests repetitively causing at least one pump of the spa to be activated for a certain time period and then deactivated at a repetition rate conditioned at least in part on the basis of said measurement associated to an ambient air temperature near the spa.

In light of the above, the Applicant submits that the subject matter of claim 67, is neither taught nor suggested by the documents cited by the Examiner. Consequently, the Applicant submits that claim 67 is patentable.

Rejection of claims 60-66

Claims 60-66, rejected by the Examiner under 35 U.S.C. §103(a), have been cancelled rendering the aforementioned Examiner's rejection moot. Hence these claims will not be discussed further here.

**CONCLUSION**

It is respectfully submitted that claims 42-45, 48, 50-54, 57, 59 and 67, are in condition for allowance. Reconsideration of the rejections and objections is requested. Allowance of claims 42-45, 48, 50-54, 57, 59 and 67 at an early date is solicited.

If the claims of the application are not considered to be in full condition for allowance, for any reason, the Applicant respectfully requests the constructive assistance and suggestions of the Examiner in drafting one or more acceptable claims or in making constructive suggestions so that the application can be placed in allowable condition as soon as possible and without the need for further proceedings.

Respectfully submitted,

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